

Amendments to the Claims

Claims 1-15 (Cancelled)

16. (Currently amended) A copper alloy sputtering target consisting essentially of:
less than or equal to about 99.99% copper, by weight;
at least one alloying element selected from the group consisting of Cd, Ca, Au, Ag, Be, Li, Mg, Al, Pd, Hg, Ni, In, Zn, B, Ga, Mn, Sn, Ge, W, Cr, O, Sb, Ir, P, As, Co, Te, Fe, S, Ti, Zr, Sc, Si, Pt, Nb, Re, Mo, and Hf, a total amount of the at least one alloying element present in the target being at least 100 ppm and less than 10% by weight; the target having a hardness of at least 40 HB; and
an average grain size of less than 1 micron with a grain size uniformity standard deviation throughout the target of less than or equal to about 15% (1-sigma).

Claims 17-18 (Cancelled)

19. (Currently amended) The target of claim 16 claim 17 having a grain size uniformity standard deviation throughout the target of less than or equal to about 10% (1-sigma).

20. (Original) The target of claim 16 having a hardness uniformity standard deviation of less than about 5% (1-sigma) throughout the target.

21. (Original) The target of claim 20 wherein the hardness uniformity standard deviation is less than about 3.5% (1-sigma).
22. (Original) The target of claim 16 wherein the target is monolithic.
23. (Original) The target of claim 16 is diffusion bonded to a backing plate, the diffusion bond having a bond yield strength of greater than about 15 ksi.
24. (Original) The target of claim 16 having an orientation distribution function (ODF) of less than about 15 times random.
25. (Original) The target of claim 16 having an orientation distribution function (ODF) of less than about 5 times random.
26. (Original) The target of claim 16 having a primary grain orientation other than (220).
27. (Original) The target of claim 16 wherein the at least one alloying element is selected from the group consisting of Ag, Al, In, Zn, B, Ga, Mg, Sn, Ge, Ti, and Zr.
28. (Original) The target of claim 16 wherein the total amount of alloying elements is from about 1000 ppm to less than about 2%.

29. (Currently amended) A copper alloy sputtering target consisting essentially of:

less than or equal to about 99.99% copper, by weight; and

at least one alloying element selected from the group consisting of Cd, Ca, Au, Ag, Be, Li, Mg, Al, Pd, Hg, Ni, In, Zn, B, Ga, Mn, Sn, Ge, W, Cr, O, Sb, Ir, P, As, Co, Te, Fe, S, Ti, Zr, Sc, Mo, Si, Re, Pt, Nb, and Hf, a total amount of the at least one alloying element present in the target being at least 100 ppm and less than 10%, by weight; the target having an average grain size of from 1 micron to about 20 micron, and having a grain size uniformity with a standard deviation of less than about 15% (1-sigma) throughout the target.

30. (Original) The target of claim 29 wherein the grain size uniformity standard deviation is less than about 10% (1-sigma).

31. (Original) The target of claim 29 having a hardness of at least about 40 HB.

32. (Original) The target of claim 29 having a hardness uniformity comprising a hardness standard deviation of less than about 5% of 1-sigma throughout the target.

33. (Original) The target of claim 29 wherein the target is monolithic.

34. (Original) The target of claim 29 is diffusion bonded to a backing plate, the diffusion bond having a bond yield strength of greater than about 15 ksi.

35. (Original) The target of claim 29 having an orientation distribution function (ODF) of less than about 15 times random.

36. (Original) The target of claim 29 having an orientation distribution function (ODF) of less than about 5 times random.

37. (Original) The target of claim 29 having a primary grain orientation other than (220).

38. (Original) The target of claim 29 wherein the at least one alloying element is selected from the group consisting of Ag, Al, In, Zn, B, Ga, Mg, Sn, Ge, Ti, and Zr.

39. (Original) The target of claim 29 wherein the total amount of alloying elements is from about 1000 ppm to less than about 2%.

Claims 40-109 (Cancelled).

110. (New) A copper alloy sputtering target consisting essentially of: less than or equal to about 99.99% copper, by weight; and at least one alloying element selected from the group consisting of Cd, Ca, Au, Ag, Be, Li, Pd, Hg, In, B, Ga, Mn, Sn, Ge, W, Cr, O, Sb, Ir, P, As, Co, Te, S, Ti, Zr, Sc, Pt, Nb, Re, Mo, and Hf, a total amount of the at least one alloying element present in the target being at least 100 ppm and less than 10% by weight; the target having a hardness of at least 40 HB.

111. (New) The copper alloy sputtering target of claim 110 further comprising at least one of Si, Zn, Ni, Mg, Al and Fe.